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METHOD OF CONTROLLING ZINC-DOPING IN A
COPPER-ZINC ALLOY THIN FILM ELECTROPLATED ON A
COPPER SURFACE AND A SEMICONDUCTOR DEVICE THEREBY FORMED

CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] This application is also related to the following commonly assigned applications, entitled:

- RRK. 3-26-04 (1) "Chemical Solution for Electroplating a Copper-Zinc Alloy Thin Film," concurrently filed (SN 10/081,074);
- 5 (2) "Method of Electroplating a Copper-Zinc Alloy Thin Film on a Copper Surface Using a Chemical Solution and a Semiconductor Device thereby Formed," concurrently filed (SN 10/082,432; Pat. No. 6,528,424);
- RRK. 3-26-04 (3) "Method of Reducing Electromigration in a Copper Line by Electroplating an Interim Copper-Zinc Alloy Thin Film on a Copper Surface and a Semiconductor Device thereby Formed," concurrently filed (SN 10/083,809; Pat. No. 6,660,633);
- RRK. 3-26-04 (4) "Method of Reducing Electromigration in a Copper Line by Zinc-Doping of a Copper Surface from an Electroplated Copper-Zinc Alloy Thin Film and a Semiconductor Device thereby Formed," filed on December 7, 2001, U.S. Patent Application Serial No. 10/016,410; Pat. No. 6,515,368;
- RRK. 3-26-04 (5) "Method of Reducing Electromigration by Forming an Electroplated Copper-Zinc Interconnect and a Semiconductor Device thereby Formed," concurrently filed (SN 10/084,563; Pat. No. 6,717,236);
- RRK. 3-26-04 (6) "Method of Reducing Electromigration by Ordering Zinc-Doping in an Electroplated Copper-Zinc Interconnect and a Semiconductor Device thereby Formed," filed on December 7, 2001, U.S. Patent Application Serial No. 10/016,645. (Pat. No. 6,630,741)

TECHNICAL FIELD

[0002] The present invention relates to semiconductor devices and their methods of fabrication. More particularly, the present invention relates to the processing of copper interconnect material and the resultant device utilizing the same. Even more particularly, the present invention relates to reducing electromigration in copper interconnect lines by doping their surfaces with a barrier material using wet chemical methods.